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ABSTRACT

A theory of vocational education and training (VET) somewhat different than that currently accepted is a set of beliefs about the purpose, practices, and principles associated with producing occupational competence. VET institutions need to be aware of and responsive to work force requirements. An analysis of information about current and future work force imbalances, along with these considerations---economic implications, public funding, and career planning--form the basis on which work force planners and policy makers can make decisions about VET courses/programs. Three alternative work force projection and forecasting approaches are labor force approach, econometric models, and input-output models. Planners also use the following labor market signaling approaches as appropriate: public employment services, job advertisements, key informant interviews, employer surveys, and follow-up studies. Fourteen cardinal practices imperative to relevant and effective VET are as follows: consolidating skilled occupations, deriving curriculum content from job analysis, performance-based training, task performance standards and criterion-referenced examinations, diversified funding sources, beneficiaries of training sharing its cost, and linking school with the workplace. Four principles help make learning and retention easier, faster, more effective, and more efficient: inform trainees of learning objectives, provide guidance and prompts, provide feedback, and provide active and purposeful practice. (A handout on funding options is appended.) (YLB)

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TRAINING THE WORKFORCE:

AN ALTERNATE APPROACH

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Contents

Part 1 — Workforce Requirements .. 3
Economic Implications 3
Public Funding 4
Career Planning 5
Determining Labor Market Demand 5
Workforce Projection and Forecasting 6
Manpower (Workforce) Approach 6
Econometric Models 7
Input-Output Models 7
Labor Market Signalling 9
Public Employment Services 10
Job Advertisements 10
Key Informant Interviews ... 11
Employer Surveys 13
Follow-up Studies 14
A Comment 16
Part 2 — A Protocol of Cardinal Practices 17
Part 3 — Learning Principles 20
Inform Trainees of Learning Objectives 20
Provide Guidance and Prompts 21
Provide Feedback 21
Provide Active and Purposeful Practice 21
References 22
Appendix A — Financing Options
Appendix B — Wisdom and Common Sense

Training the Workforce: An Alternate Approach

Numerous documents and speeches have declared that the U.S.A. is losing the competition for world markets and have argued that education must better serve the economy. Economic comparisons used to show the gravity of the situation, combined with the argument that inadequacies of public education are contributing to the decline, have led to international comparisons of vocational education and training (VET) systems. The policies that follow from this assessment will no doubt align the public VET system more closely with the economic system.

The Department of Human Resource Development at The University of Tennessee has undertaken a number of studies with the express purpose of learning what it is that makes our international competitors successful in producing the skilled workers required by their economies. The countries selected for study were, not surprisingly, those with the most successful economies.

This paper describes a theory of VET that is somewhat different than what is currently accepted in the U.S.A. It is a set of **reasoned beliefs about the purpose, practices, and principles** to produce occupational competence. Such beliefs are sometimes called a philosophy. However, it is less confusing to say that it is a theory. The difference is important because, in many controversies, evidence for conflicting beliefs comes from empirical theories. There is no point in raising philosophical issues if the controversy can be settled by facts or empirical theories about the facts. The philosophical issue is raised when common sense, facts, and experience fail to solve problems or resolve controversies.

A well-worked-out theory provides VET with a consistent set of guiding principles; this, in turn, should result in a consistent policy for action. Policy, to be effective in securing funding and influence for VET, has to address personal, local, statewide, and national economic needs.

This paper provides a practical examination of the (a) purpose, (b) practices, and (c) principles of teaching/learning an occupation, from a basis of common sense, fact, and experience. It is organized into three parts, plus two appendixes.

Following this introduction, part one discusses the impact of workforce requirements on the purpose of VET. Part two presents a protocol of cardinal practices for the initial training of skilled workers. The third part presents four principles which help make learning and retention more effective and more efficient.

Part 1 — Workforce Requirements

The purpose of VET is to provide individuals with the knowledge, skills, attitudes, and so forth, necessary for gainful employment. To accomplish this purpose, VET institutions need to be aware of and responsive to **workforce requirements**.

Information about current and future workforce imbalances (shortages and surpluses) is collected using the approaches presented in this part one of the paper. An analysis of this information, along with the following three considerations, form the basis on which workforce planners and policy-makers can make coherent decisions about VET courses/programs.

1. Economic implications
2. Public funding
3. Career planning

Economic Implications

Shortages of skilled workers cause bottlenecks in production and have an undesirable effect on the economy. By providing the skilled workers needed at the local, state, and national levels, VET plays a fundamental role in the maintenance of a healthy economy. Research by Cinkel (1981) supported this view when it concluded that meeting labor market needs is VET's number one challenge.

Another problem which adversely affects the economy as well as society is a surplus of trained workers in an occupation with few if any employment opportunities. Graduates find it difficult to keep their dignity and take care of financial and family obligations when the jobs for which they trained are not available. If unemployment results, then there is the cost of public assistance on top of the public investment already made in training.

Although workforce planners and policy-makers are not accountable for ensuring a perfect fit between training offerings and employment opportunities, they should

anticipate shortages and surpluses of skilled workers. Policy-makers can then take corrective action by adjusting the type, number, size, and so forth of course/program offerings to reflect quantitative and qualitative requirements.

Public Funding

It is increasingly evident that the role of public education is not merely to prepare young adults for more academic study at a college or university. Schooling is expected to help individuals fit into society; this means attending to their occupational future. With this in mind, it has been suggested that public funds should be equitably distributed between (a) VET, at the compulsory and post-compulsory levels, for the many who need and can benefit from it; and (b) college education.

Research by the National Center on Education and the Economy found that about 70% of jobs in the U.S. do not require the costly and lengthy schooling associated with earning a bachelor's degree. Furthermore, in spite of the increasing social pressure to enter college, a 1996 report from American College Testing (ACT) showed fewer college students are continuing after their first year. A related ACT study found that 47% of college students never earn a baccalaureate degree. Other studies and news reports focus on the rising number of under-employed college graduates and those who drift between unemployment and occasional jobs.

Consequently, the often generous public funding of those four-year college degree programs that turn out a graduate population in excess of labor market needs is misplaced, especially when that public money could have been invested in relevant VET for the many who need it in order to qualify for existing jobs. Likewise, planners and policy-makers can ill afford to misuse those resources (funding, facilities, personnel, etc.) which are invested in VET by preparing people for jobs where there is insufficient demand, or even worse, for jobs that no longer exist.

No matter how logical this line of reasoning appears, it runs counter to elitist tendencies, vested interests, and socio-political pressures. Therefore, authoritative information on the the economy's skilled worker needs is essential to those who must respond to pressure from individuals and special interest groups.

Career Planning

The utopian dream is for each individual to have unrestricted freedom in deciding on their occupation and career goals. While it is generally accepted that an individual's interest in and preference for a particular occupation should be considered, the resulting **social demand** for certain education and training **can be unrealistic**. This is especially true when there are few if any employment opportunities for the occupation and the education and training would be at public expense.

In such cases, planners and policy-makers must **reconcile social demand with labor market demands**, given limited financial resources. While allowances can be made for the aspirations of young people and parents' desires for their "kids to have it better than they did," there must be some limit to such latitude, given the quest for efficient spending by taxpayers and responsive public officials.

It is reasonable to expect that incentives such as program subsidies, tuition aid, and tax breaks should be made available to attract young adults into occupations where there is a labor market shortage. In any event, they typically choose an occupation for which there is a realistic opportunity for self-fulfillment and secure employment. Responsible planning which results in rational career decisions requires up-to-date information about present employment prospects, estimated future needs, and occupational requirements as well as training opportunities.

Determining Labor Market Demand

Based on the three considerations just presented, as well as others, there is general agreement that **there ought to be a close training-employment relationship in the planning and decision-making for VET**. However, labor market demand is not easily determined. Additionally, profiles of job and skill requirements are a consequence of changes in technology; work organization, including staffing; consumer patterns; and the restructuring of the world-wide economic system.

There are a number of approaches for determining labor market demand. Some focus on long-term national projections and forecasts, while others are more appropriate for short-term local and regional needs. Even though experts question the utility of projecting or forecasting long-term national labor market demands in a free-market

economy, where decision-making is de-centralized, public agencies and research institutions as well as others continue the practice. This is largely because decisions must be made about (a) maintaining, expanding, improving, curtailing, or discontinuing existing courses/programs; (b) the utilization and upgrading of existing facilities, equipment, and faculty; (c) adding new courses/programs; (d) financing, building, and equipping new facilities; and (e) recruiting and hiring qualified instructors. Suffice it to say, the more people there are involved in the decision-making process and the longer the training period, the greater the need by all concerned parties to plan ahead of skilled workforce demands.

Workforce Projection and Forecasting

The alternative workforce projection and forecasting approaches introduced here are the (a) manpower (workforce) approach, (b) econometric models, and (c) input-output models. All three **attempt to quantify the long-term future labor market demands of the economy**.

Manpower (Workforce) Approach

The workforce approach relates forecast or planned economic growth to the output of VET institutions (schools, institutes, apprenticeships, etc.) based on plausible assumptions. One such assumption is that certain sectoral economic growth rates are reachable targets (Lauglo, 1993, p. 7). The skilled worker needs derived from these targets can be used in planning VET course/program offerings.

This approach, as usually practiced, includes the following six steps:

1. Forecast employment levels in the target year (a future date) for each economic sector/subsector
2. Estimate the distribution of various occupations (staffing patterns) in each sector/subsector
3. Convert the employment forecasts into a set of projections by occupation
4. Project replacement needs — those arising from job turnover and occupational mobility

5. Combine steps three and four for each occupation to estimate employment possibilities

6. Compare the estimated employment possibilities to the expected output of VET institutions

The various strengths and weaknesses of the workforce approach are listed in Table 1.

Econometric Models

These models represent a set of equations describing the complex interrelationships of the different economic sectors. Econometric studies are a sophisticated long-term forecasting approach customarily conducted by economists. Their output is a set of estimates of levels of employment in various sectors for the target year (Bertrand, 1992, chap. 1). Users of this information are cautioned not to assume a straight-line trend between the base year (year of the study) and the target year. Econometric models are an alternative to the first step of the workforce approach. Table 1 presents the strengths and weaknesses of econometric models.

Input-Output Models

Like the econometric models, input-output models constitute the first step of the workforce approach. Input-output models are used to construct a table that displays the exchange of goods and services among producing and purchasing industries over a set period of time. The industrial output is translated into employment demands within industries. Total employment within an industry is related to its total output and expressed in terms of a workforce input coefficient. These coefficients show the labor market demand of an industry per unit of output (Bezdek, 1974, p. 3-13).

The following three steps characterize the input-output analysis:

1. A projection is made of the output of a particular industry. For example, mining — the tons of coal mined over the period of time desired.

2. A workforce coefficient — for example, one miner per 10,000 units of output — is applied to the absolute increase in production to arrive at an estimate of labor market demands.

3. The projection and workforce coefficient are then translated into the number of skilled workers needed by occupation (Mingat & Tan, 1988, p. 104).

Table 1. Strengths and Weaknesses of Workforce Projection and Forecasting Approaches

Strengths	Weaknesses
Manpower (workforce) approach	
• Projects long-term quantitative skilled worker needs	• Conversion of sectoral-level forecasts to occupations is problematic
• Methodology is straightforward, appealing to common sense, and readily comprehensible	• Reliability affected by uncontrollable factors, such as overly optimistic estimates of employment growth, rapid economic change, lack of allowance for technological advances, changing business practices, job turnover, and occupational mobility
• Popular with economists, workforce planners, and policy-makers	
• Relatively modest data requirements	• Accuracy and reliability diminish with greater disaggregation
Econometric models	
• Sensitive to a variety of factors which affect the level and structure of employment	• Extensive data requirements
	• High data maintenance costs
• Methodological improvements allow for replacement needs to compensate for job turnover and occupational mobility	• Highly technical and, therefore, difficult for planners and policy-makers to access, comprehend, or use
• Data base used can be updated to take into account variations in population, etc., which directly impact employment projections. Update feature gives model a dynamic nature lacked by other approaches	• National data not entirely useful for local or regional planning
	• Accuracy problem with models based on population, workforce, productivity, consumption, and output projections
Input-output models	
• Capable of producing highly detailed employment projections	• Complex, laborious, and expensive, requiring specialists and sophisticated computer capabilities
• Equally appropriate for impact analysis	• Extensive data collection and manipulation requirements

The particular strengths and weaknesses of input-output models are shown in Table 1 on the previous page. This word table facilitates comparisons and contrasts of the three workforce projection and forecasting approaches.

Labor Market Signalling

Rather than rely exclusively on sophisticated long-term projections and forecasts, with their difficulties and shortcomings, present-day workforce planners also utilize appropriate labor market signalling approaches. The five approaches identified in Figure 1 involve the collection and careful analysis of information on workforce supply and demand in local/regional labor markets. **Labor market signalling approaches identify current and short-term (future) job opportunities and can provide information on knowledge and skill requirements as well as employer screening and hiring practices.** This valuable information should be routinely updated by the regular use of appropriate labor market signalling approaches.

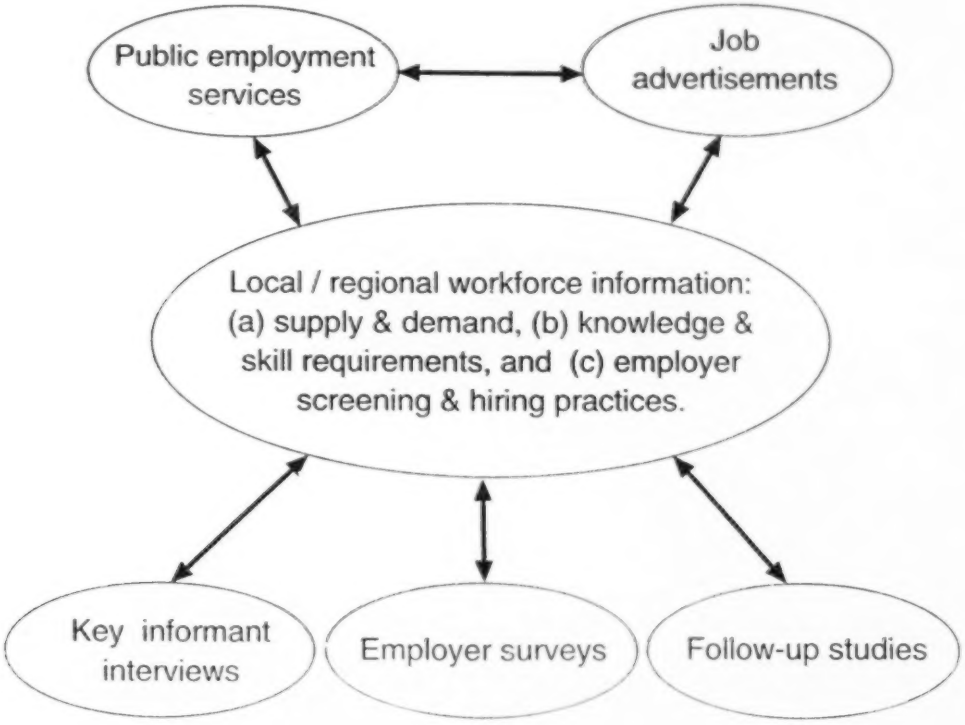
Public employment services
Job advertisements
Local / regional workforce information: (a) supply & demand, (b) knowledge & skill requirements, and (c) employer screening & hiring practices.
Key informant interviews
Employer surveys
Follow-up studies

Figure 1. Labor Market Signalling Approaches

Public Employment Services

Labor market signals can be captured by monitoring workforce movements in the employment and unemployment (resignations, layoffs, and discharges) of workers. Most public (state) employment services collect and compile information on unemployment rates, job openings, and placements. Nevertheless, the data is seldom analyzed and few, if any, decisions are reached concerning present workforce requirements and labor supply or probable future requirements.

For example, tallying the number of openings, by job title, is not only useful in itself, but makes it possible (over time) to monitor trends in the demand for and supply of skilled workers. Thus, when job opening rates fall, unemployment rates rise, or employment growth declines for workers with particular skills, this signals a downturn in the need for these skills and, hence, in the benefits of providing training to produce them. Conversely, when jobs in a particular occupation remain unfilled for lengthy periods of time, it may signal a shortage of skilled workers in that occupation. There is a great need for the information a public employment service could supply. However, such information must be available on a timely basis in a usable form (Campbell, 1996, chap. 1). Table 2 on the following page provides strengths and weaknesses of the public employment services approach.

Job Advertisements

There is little or no systematic monitoring of job (help-wanted) advertisements that appear in newspapers, trade publications, professional journals/magazines, and other print media. Yet, the collection and analysis of these public listings provides current labor market demand information and, over time, reveals employment trends in a host of occupations, e.g., a decrease in the demand for surveyors and an increase in the number of job vacancies for cooks.

Help-wanted ads provide a great body of handy and usable information. Unfortunately, only a part of the actual job openings are advertised and the information on these is often imprecise and/or incomplete. Therefore, the employer or employment agency who floated the ad must be contacted in order to obtain further details. The strengths and weaknesses of job advertisements are listed in Table 3 on page 12.

Table 2. Strengths and Weaknesses of the Public Employment Services Approach

Strengths	Weaknesses
• Services are in touch with local, regional, and state labor market happenings, collecting, compiling, analyzing, and reporting information on unemployment and present as well as future job openings	• Data available is more or less incomplete and may not be representative of overall labor market situation
• Planners can use available data in determining training needs	• Information available is inadequate and could be misleading due to extent to which employers report job openings and duplication of information with that from help-wanted ads
• No sizable investment of new resources is required for generating and disseminating the data	• Services are more highly concentrated in urban areas catering to the formal sector, where they function mainly as a job exchange for the unemployed
	• Generation and dissemination of labor market information is performed as a side-line

Key Informant Interviews

Interviews of individuals who are involved in planning for their company or agency, or who otherwise have first-hand knowledge about workforce demand and the supply of skilled workers in an economic sector and geographic area, offer another way to obtain valuable information. Essential preconditions for the satisfactory outcome of key informant interviews include the careful selection of knowledgeable individuals from local/regional (a) businesses; (b) public agencies; (c) economic development authorities; and (d) employer, worker, trade, and professional associations/organizations. Other important preconditions are the use of a structured interview schedule limited to well-

Table 3. Strengths and Weaknesses of the Job Advertisements Approach

Strengths	Weaknesses
• Provides current demand information and, over time, reveals employment trends	• Focuses principally on metropolitan areas
• Major newspapers contain voluminous sections of job advertisements	• Number of ads in local or regional newspapers may be insufficient to construct a sample for analysis
• Analysis of advertisements complements signals received from other sources	• Variety and number of job openings underrepresented due to some employers not using want ads
• Analysis could be undertaken by occupational training planners who could also discuss ads with the employers who floated them	• Some advertised jobs have already been filled or otherwise do not currently exist
• An easy and inexpensive approach to identifying jobs with favorable employment prospects	• Deals with past and present, not future, needs and cannot predict future industry growth or change
	• Employer must be contacted for further details when information is imprecise and/or incomplete

constructed core questions, the timely analysis of the information obtained, and regular and frequent follow-up of the signals captured.

Core questions focus on current and expected workforce supply and demand imbalances. They also seek to determine factors underlying such imbalances, and the most critical workforce issues. Other questions can address employer recruitment, screening, hiring, promotion, and training practices.

It is important to add that regular consultations with key informants, to discuss workforce supply and demand problems and/or interpret demand projections resulting

Table 4. Strengths and Weaknesses of the Key Informant Interviews Approach

Strengths	Weaknesses
• Straightforward and modest in cost • Information yields current indicators of workforce supply and demand imbalances in local/regional markets • Information gives early warning signals about forthcoming changes in workforce supply and demand • Information can be gathered on employers' screening, hiring, and training practices • Can be conducted with individuals and groups, in the public and private sectors, as well as in formal and informal labor markets	• Information is mainly qualitative and may lack objectivity • Interviewer's bias, demeanor, and appearance can distort responses • Information is not representative in terms of research rigor

from other approaches, are a prudent practice. Experience has shown that carefully selected individuals are able and willing to provide input. Table 4 provides some of the strengths and weaknesses associated with this approach.

Employer Surveys

Employers are the ones who decide on hiring. Theirs is the last word on what the market wants. It is logical, therefore, to ask them what their present and future needs are. The most cost-effective way of doing this is to use mailed questionnaires or conduct personal (face-to-face) interviews.

Questionnaires and interview schedules vary from open-ended to closed-ended instruments. The closed-form instrument is recommended when categorized data is

needed; whereas, the open-ended is best-suited for preliminary exploration of untried situations. Telephone interviews are limited in use and not usually appropriate for a comprehensive survey.

Large, medium, and small private and public sector employers within a geographic area (including all places that workers are willing to travel without changing their residence) are identified and asked to specify their present and predict future workforce requirements. They are also asked to provide information on knowledge and skill requirements, as well as their screening and employment practices. This information helps to identify which businesses and occupations are growing and which are declining. It supplements the data gathered from other approaches, such as reporting by employment services (Campbell, 1996, chap. 1). See Table 5 for the strengths and weaknesses of the employer surveys approach.

Follow-up Studies

Follow-up studies, usually conducted as part of the process for evaluating training courses and programs, can provide valuable information for workforce planners. Longitudinal follow-up studies are used to establish and monitor labor market trends and determine the geographic mobility, wage, and employment patterns of former trainees.

A follow-up questionnaire is developed, pilot-tested, and then mailed to course/program completers (graduates). Among other things, graduates are asked about their present employment status and whether they found a job for which they were trained. If graduates are employed in a different job, the studies also seek to find out how useful they consider their training to have been for their actual job.

The questionnaire also asks graduates (a) how they found their job, (b) how long it took, (c) what their starting and present wages are, (d) whether skill requirements have changed, and (e) if different training would have made finding employment easier. An analysis of responses to these and other questions helps to determine the demand relevance of particular VET courses or programs and sheds light on the circumstances of entry into the labor market.

It is recommended that follow-up studies be conducted approximately 6 months after course/program completion, at the end of the first year, and again at the end of

Table 5. Strengths and Weaknesses of the Employer Surveys Approach

Strengths	Weaknesses
• Goes right to the source of labor market demand	• Not all employers are able (or willing) to provide detailed predictions of occupational demand
• Provides useful information in a reasonable period of time	• Estimates provided by employers may be biased toward overestimation if they feel that their replies will positively affect the availability of skilled workers
• Employers' willingness to cooperate is increased, because their views and suggestions are considered	• Different employers may classify jobs in different ways, thus affecting the comparability of the information collected
• Direct contacts can enhance the collaborative relationship between occupational training institutions and employers	• Comparability suffers as changes in the workplace alter job requirements, especially when the jobs are not reclassified
• Personal interview method provides a high response rate and yields precise and complete information on a host of relevant questions	• Surveys do not cover skilled worker demand in the informal sector, particularly in rural areas

the second and third years. Analysis of data over a three-year period provides a more complete picture of trends and patterns in responses to important questions such as:

1. Are graduates available for employment? If not, why (pursuing further training, etc.)?

2. Is it getting harder or easier to find a particular job?

3. Can graduates gain and hold employment in the jobs for which they were trained?

4. Are graduates employed in jobs other than the one for which they were trained?

5. What are the wage rates, by occupation, sector of employment, age, and gender?

It is not necessary, at the outset, to conduct large-scale studies in order to gain an initial idea of the situation. To begin with, a study can be made of small populations, giving priority to courses or programs which create the most urgent problems (Bertrand, 1992, chap. 7).

One dilemma is that unemployment rates, waiting periods, the acceptance of unrelated jobs in other geographic areas, and wages earned do not indicate on their own the success or failure of a particular course or program. This information needs to be supplemented by comparisons with (a) the employment record of a control group, (b) feedback from employer interviews, (c) different courses or programs, (d) other training institutions, and (e) local/regional employment conditions as well as trends. The strengths and weaknesses of this approach are provided in Table 6.

A Comment on Determining Workforce Requirements

The nature of labor supply and demand imbalances, and the need to capture changes in a timely fashion, suggests the importance of using labor market signalling approaches. These approaches involve routine data collection and analysis — rather than the mechanistic-type workforce projections and forecasts which are made at a single point in time (Campbell, 1996, chap. 1).

The last point to be made is that there is no one best approach for determining workforce requirements in all situations. Each approach has its particular strengths and weaknesses which must be considered when selecting the ones to be used. Moreover, the use of several approaches is preferable to the application of any one.

Table 6. Strengths and Weaknesses of the Follow-up Studies Approach

Strengths	Weaknesses
• Reveals what actually happened to graduates in the labor market • Monitors training courses/programs, thereby facilitating adjustments to meet workforce requirements • Information collected on employment and wages of graduates provides signals on the balance of supply and demand by job title in private, public, and informal sectors • Relatively inexpensive and produces useful results quickly	• Problems arise when including objectives that are not related to how graduates have fared in the labor market • Response rates and the quality of answers diminish, if questionnaires are too long or complicated • Poor response rates result from out-dated or incomplete addresses • Contributes little toward identifying the need for new VET courses/programs

Part 2 — A Protocol of Cardinal Practices For the Initial Training of Skilled Workers

After considerable discussion and debate at the Rockefeller Foundation's Bellagio Study Center in northern Italy, an international panel of scholars and practitioners agreed that the following practices are imperative to the continuing success of VET in the next millennium. Each of these cardinal practices has been implemented successfully in one or more nations or states. When all 14 practices are adopted, there will no doubt be more relevant, effective, and efficient VET.

1.0 Transferable training calls for following the German example of **consolidating skilled occupations**, thereby broadening the skill base for those that remain.

2.0 Theoretical and practical **curriculum content is derived from job analysis** which involves incumbent skilled workers and employers.

2.1 Theoretical content must be occupation-specific and meaningful (i.e., tied to job tasks and taught through relevant experiences/activities).

3.0 All instruction must be conducted in the [English] language and must include timely opportunities for practice.

4.0 **Performance-based training** ought to be used because of its advantages over the traditional time-based approach. While some may complete a training program faster under a performance-based system, others could take longer. Nevertheless, what they would have in common is attainment of all proficiency requirements for a skilled occupation.

5.0 Institute a national system of **task performance standards** and **criterion-referenced examinations** such as those already in use for welding and automotive mechanics in the U.S.A.

5.1 Standards to be industry driven, nationally accepted, and updated as necessary.

5.2 Standards to be linked to measures of proficient performance.

5.3 Criterion-referenced theory and performance examinations to measure proficiency and to provide feedback on the quality of training.

6.0 Centralize training requirements to ensure the portability of proficiency credentials (certificate, diploma, license, etc.). The German government has centralized responsibility for the employer-based part of VET at the national level because of its important effects on economic and employment systems. The Swiss centralized responsibility at the cantonal (state) level.

6.1 Standards must be used to develop a recognized, respected, and portable credential that facilitates upward (career) and geographic mobility.

7.0 Establish and articulate a coherent policy, implementation strategy, and priorities.

7.1 Orient training toward jobs with **prospects for gainful employment** within the trainees' personal geographic mobility potential.

7.2 Conduct training in an environment typical of the one in which the trainee will work, or in a closely simulated environment.

7.3 Train with the tools, equipment, and materials used in the performance of tasks at the workplace.

7.4 Redefine VET as **a system of continuing learning** rather than a once-for-a-lifetime experience.

7.5 Facilitate **vertical and horizontal mobility**. Vertical mobility includes the movement to higher skill levels or a higher-level job. Horizontal mobility includes the movement to related jobs.

8.0 When an employer cannot provide training and work experience in a job task, their trainee(s) is rotated to another employer(s) who can, or the necessary instruction and practice is provided at a training center.

9.0 Related instruction must be occupation based and harmonized in time and content with work experiences.

10.0 School-based and employer-based instructors shall be occupationally and personally qualified and must successfully complete an instructor training program. This is a requirement in Germany and Switzerland.

11.0 To attract and retain quality instructors, scholarships must be available for instructor training (may include bonded periods of service after graduation) and salaries must be competitive with employment at the supervisory level in their occupation.

12.0 Place control, authority, and accountability for VET in a tripartite organization. Power sharing is facilitated by including equal representation from (a) employers (private sector), (b) worker organizations (unions), and (c) government (including education, training, employment, and economic development authorities). The views of school-based and employer-based instructors are also considered.

13.0 **Diversify the sources of funding**. In addition to public support, seek funds from employers, employees, foundations, etc. to ensure adequate and stable financing. A form of levy-grant system, financed through a payroll training tax, may encourage employers to invest in training. It should be pointed out that a payroll training levy

is a basis for training trust funds established through collective bargaining. In Germany, both government incentives and the recurrent threat of intervention stimulate businesses to participate. See Appendix A.

13.1 The **beneficiaries of training should share its cost** — individual trainees, employers, and the state — in appropriate proportions, depending upon the (a) status of the trainee — youth or adult, employed or unemployed, etc.; (b) amount of benefit; and (c) need for skilled workers in the occupation under consideration.

13.2 Businesses that participate in VET need to be recognized for their **contribution to economic and social development**.

13.3 There ought to be parity between the public subsidization of secondary and post-secondary academic education and VET.

14.0 **Link the schoolhouse with the workplace**. In Germany, Switzerland, and other industrialized countries, businesses play an active role in curriculum and trainee selection decisions, and in the design and provision for workplace training experiences.

Part 3 — Learning Principles

Four principles which are broadly applicable in creating appropriate learning events/activities for VET are:

1. Inform trainees of learning objectives.
2. Provide guidance and prompts.
3. Provide feedback.
4. Provide active and purposeful practice.

These principles help make learning and retention easier, faster, more effective, and more efficient.

Inform Trainees of Learning Objectives

Trainees are more successful in attaining learning objectives when they understand what is expected of them. To create this understanding, the instructor should disclose and discuss, at the beginning of a lesson, the learning objective (a) behavioral action statement,

(b) performance conditions, and (c) attainment standards. Including learning objectives on instructional materials also helps trainees learn.

Provide Guidance and Prompts

Trainees should be told and shown how to perform. They need clear explanations and step-by-step directions on what to do. Performance needs to be as error-free as possible the first time, since an error once made is likely to recur. A trainee who performs an activity incorrectly the first time may have difficulty unlearning in order to learn the correct performance. Therefore, verbal and visual prompts should be provided before, during, and after practice to prevent guesswork and ensure correct performance.

Trainees learn by applying, in a meaningful, varied, and concrete way, what they are taught. Applied learning, done in the context of performing a task, enables trainees to use new knowledge. In addition, applied learning experiences proceed most effectively and tend to be most permanent when they are personally meaningful. Finally, learning is an individual process in which trainees gain knowledge and skills and shape attitudes through their own activities, experiences, and motivation.

Provide Feedback

Honest, objective, and constructive feedback on how trainees are doing improves performance and reinforces learning. Such feedback must be informative and received as soon as possible after performance. It should provide information on what is right or wrong as well as what corrective action to take. Effective feedback addresses both strengths and weaknesses. It reflects the instructor's consideration of the trainee's need for self-esteem, confidence, recognition, and the approval of others.

Criterion-referenced knowledge and performance tests, as well as written work, ought to be used as teaching tools by fairly assessing the attainment of learning objectives. The evaluation process provides reinforcement for correct performance and includes corrective action for mistakes.

Provide Active and Purposeful Practice

Frequent opportunities to review knowledge and practice the performance of skills are critical to learning and retention. Trainees need physical activity to refine the coordination between visual and tactile senses. Furthermore, when the activity involves

manipulating real objects, all the cues for later performance are available. While hands-on practice may be the only way to achieve coordination, continual practice of a learning experience which has already been correctly performed can be tiresome. Nevertheless, some degree of overlearning is desirable in order to enhance retention and assure the transfer of knowledge and skills to the job. The most practical way to achieve overlearning is by repeatedly performing a task correctly. Extensive practice on a single task should be interspersed with short rest periods (Campbell, 1996, chap. 2).

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APPENDIX A

FINANCING OPTIONS

1. External sources of funds — Funding from outside the vocational center
2. Internal sources of funds — Money earned and saved through center and personnel activities

1. External Sources of Funds — Funding from Outside the Vocational Center

1.1 Public support from government agencies (Alternative financing includes the use of other sources such as those listed in items 1.2 - 1.6.)

Tax (taxpayer) Based

- Income tax
- Property tax
- Sales tax
- Value-added tax (VAT)
- Import/Export tax
- National endowment (funding from taxes)

Other

- Sale of natural resources (coal, oil, natural gas, gold, timber, etc.)
- Licenses (marriage, professional, etc.) and permits
- Lotteries/gambling

1.2 Employer and/or employee support

- Training levy on employers and workers
- Payroll tax (levy) on employers (French employers must spend a percentage of their payroll on training and report this to the government.)

1.3 Endowment by individuals, companies, foundations, etc.

1.4 Contributions/gifts by alumni, friends, etc. (e.g., wealthy philanthropists make a large gift, and a classroom, laboratory, or building is named after them)

1.5 Donations/loans of equipment, facilities, etc. by public and private organizations

1.6 Scholarships — alumni, friends, businesses, associations, etc.

1.7 Loans from banks or the government on favorable terms

2. **Internal Sources of Funds — Money Earned by Employees and Trainees**

2.1 Tuition and fees

2.2 Rental and lease of equipment, facilities, and grounds

2.3 Vending machines

2.4 Income from work performed by

- Employees — contract training and consulting services
- Trainees — production technique (the sale of produce and products)

2.5 Ticket sales to athletic events, concerts, plays, etc.

3. **Internal Sources of Funds — Money Saved by Employees, Trainees, and Volunteers**

3.1 Employees, trainees, and/or volunteers operate/maintain equipment, grounds, and facilities

- Operate print shop/duplication center, restaurant, laundry, etc.
- Grow crops, keep animals, make ice cream, cheese, etc.

3.2 Volunteers, including retired people, provide support services

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Note. Vocational education and training (VET) is an investment in human capital formation by those who finance it. There is a public return in addition to the private return to individuals, as reflected by wages earned, and employers, as reflected by an improvement in workplace goals. Diversifying the funding sources enhances the sustainability of VET.

APPENDIX B

WISDOM AND COMMON SENSE

Questions about vocational education and training were once answered by turning to wisdom and common sense. The following old sayings may have been the earliest guiding principles (statements of best practices). They continue to provide a sound basis for practical action.

SAYING:	An **adage**, **proverb**, or **maxim**; expression of wisdom or truth
ADAGE:	An old saying tested over the years until popularly accepted as a truth
PROVERB:	A piece of practical wisdom expressed in homely, concrete terms
MAXIM:	A general principle drawn from practical experience and serving as a rule; a popularly accepted saying that contains the wisdom of the past and many nations.

1. Learn by doing (We learn to do by doing)
2. Learn from experience
3. Practice makes perfect
4. Skill comes from drill
5. Use it or lose it
6. If it's worth doing, it's worth doing right
7. Plan your work; work your plan
8. Haste makes waste
9. Better late than never
10. Never enough time to do it right the first time, but always time to do it over
11. Being ignorant is not so much a shame as being unwilling to learn
12. Knowledge is power
13. Two heads are better than one
14. You cannot teach what you don't know
15. You cannot teach a man anything; you can only help him to find it within himself